Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

ORGANIZED 1878 INCORPORATED 1891

JANUARY
1913

VOLUME XXXII No. 1

TRANSACTIONS
OF THE
AMERICAN MICROSCOPICAL SOCIETY

PUBLISHED QUARTERLY BY THE
AMERICAN MICROSCOPICAL SOCIETY
DECATUR, ILLINOIS
ANNUAL SUBSCRIPTION $3.00 SINGLE COPY $1.00
DOUBLE NUMBERS $2.00

W. WATSON & SONS MICROSCOPES.

RESEARCH MICROSCOPE

WATSON'S "RESEARCH" MICROSCOPE

Watson's "Research" Microscope with long range Mechanical Stage on Turrell system. Compound Substage with rack-work focussing and centering screws.

Fine Adjustment with vertical lever operated from either side of limb,—never failing,—no cogs or complications.

An ideal Instrument for the Amateur or Bacteriologist.

$58.50

WHY A WATSON'S MICROSCOPE?

It enables the worker to extract from his optical fittings the finest results they are capable of yielding. Refinements for working are provided which long experience of experts has proved to be the sole means for achieving such results.

The Watson Microscope does not fall over when it is touched; it has a tripod foot.

It can be used for very low magnification as well as for the highest. The long range of coarse adjustment permits this.

The mechanical stage is scientifically constructed as a part of the whole instrument and not an easily disordered attachable accessory.

The Watson-Wenham Binocular Body is a feature of the Watson Instrument.

All fittings are interchangeable and are standardised to the gauges of the Royal Microscopical Society.

Working parts of the Watson Instruments have spring fittings and adjusting screws whereby wear may be compensated for.

Watson Condensers have the necessary aplanatic cones for developing the fullest capacity of the objective, and the substage which carries the condenser is constructed with centering screws to enable it to be efficiently used.

Watson British-made Microscopes are Scientific Instruments for Scientific work, not merely tools that magnify. They are the Microscopes of to-day and the future. They give a lifelong working efficiency.

Do Not Handicap Your Possibilities

START RIGHT AWAY

With Every Advantage

Full particulars of the above and of all accessories for Microscopical work are given in Watson's 168 page catalogue of Microscopes, sent post free on application.

WATSON'S UNRIVALED MICROSCOPIC OBJECTS

The Best Test Objects, The Most Beautiful Exhibition and "Oh My!" Slides, The Finest Typical Sections for Educational Purposes can be selected alone from the largest stock of Micro-Objects in the World at WATSON & SONS.

Send for Catalogue No. 3A.M. for full particulars, free on application.

W. WATSON & SONS **MICROSCOPE MAKERS**
Wholesale and Retail
Established 1837 313 High Holborn, London, England
There is no duty on Microscopes imported for Educational Institutions.

TRANSACTIONS

OF THE

American Microscopical Society

ORGANIZED 1878 INCORPORATED 1891

PUBLISHED QUARTERLY

BY THE SOCIETY

EDITED BY THE SECRETARY

VOLUME XXXII

NUMBER ONE

Entered as Second-class Matter December 12, 1910, at the Postoffice at Decatur, Illinois, under act of March 3, 1879.

DECATUR, ILL.
REVIEW PRINTING & STATIONERY CO.
1913

OFFICERS.

President: F. Creighton Wellman, M. D.	New Orleans, La.
First Vice President: F. C. Waite, Ph.D.	Cleveland, Ohio
Second Vice President: H. E. Jordan, Ph.D.	Charlottesville, Va.
Secretary: T. W. Galloway	Decatur, Ill.
Treasurer: T. L. Hankinson	Charleston, Ill.
Custodian: Magnus Pflaum	Meadville, Pa.

ELECTIVE MEMBERS OF THE EXECUTIVE COMMITTEE

H. L. Shantz	Bureau Plant Industry, Washington, D. C.
J. W. Scott	Manhattan, Kans.
Geo. E. Coghill	Granville, Ohio

EX-OFFICIO MEMBERS OF THE EXECUTIVE COMMITTEE

Past Presidents still retaining membership in the Society

R. H. Ward, M.D., F.R.M.S., of Troy, N. Y.,
at Indianapolis, Ind., 1878, and at Buffalo, N. Y., 1879.

Albert McCalla, Ph.D., of Chicago, Ill.
at Chicago, Ill., 1883

T. J. Burrill, Ph.D., of Urbana, Ill.,
at Chautauqua, N. Y., 1886, and at Buffalo, N. Y., 1904.

Geo. E. Fell, M.D., F.R.M.S., of Buffalo, N. Y.,
at Detroit, Mich., 1890.

Simon Henry Gage, B.S., of Ithaca, N. Y.,
at Ithaca, N. Y., 1895 and 1906.

A. Clifford Mercer, M.D., F.R.M.S., of Syracuse, N. Y.,
at Pittsburg, Pa., 1896.

A. M. Bleile, M.D., of Columbus, Ohio,
at New York City, 1900.

C. H. Eigenmann, Ph.D., of Bloomington, Ind.,
at Denver, Colo., 1901.

Charles E. Bessey, LL.D., of Lincoln, Neb.,
at Pittsburg, Pa., 1902.

E. A. Birge, LL.D., of Madison, Wis.,
at Winona Lake, Ind., 1903.

Henry B. Ward, A.M., Ph.D., of Urbana, Ill.,
at Sandusky, Ohio, 1905.

Herbert Osborn, M.S., of Columbus, Ohio,
at Minneapolis, Minn., 1910.

A. E. Hertzler, M.D., of Kansas City, Mo.,
at Washington, D. C., 1911.

F. D. Heald, Ph.D., of Philadelphia, Pa.,
at Cleveland, Ohio, 1912.

The Society does not hold itself responsible for the opinions expressed by members in its published *Transactions* unless endorsed by special vote.

TABLE OF CONTENTS

FOR VOLUME XXXII, Number 1, January, 1913

Dissemination of Fungi Causing Disease, by F. D. Heald (Presidential Address for 1912) 5

Periodicity of Algae in Illinois, 8 Text Figures, by Edgar Allen Transeau 31

Nature and Classification of Plant Rusts, 5 Text Figures, by Frank D. Kern 41

Notes and Reviews—Notes on Some Peculiar Sense Organs in Diptera (illustrated); Convenient Dropper for Use in Cutting Celloidin Sections (illustrated); Critical Illumination for the Microscope; Cleaning Diatoms; Staining Protozoa; Double-stain Method for Polar Bodies in Diphtheria Bacilli; New Technic in Staining Diphtheria Specimens with Toluidin Blue; Notes from the Meeting of the Illinois Microscopical Society; Bog Solutions and Plants; Effects of Cropping on Soil Bacteria; Alternation of Generation in the Phaeophyceae; Experiments on the Germination of Teleutospores; Direction of Locomotion in Starfish; A Rotifer Parasitic in Egg of Water Snails; Englenids and Their Affinities; An Ameba with Tentacles; Some American Rhizopods and Heliozoa; Size of Chromosomes and Phylogeny; Spermatogenesis in Hybrid Pigeons; Male Germ Cells in *Notonecta;* Interstitial Cells of Testis and Secondary Sex Characters; Microbiology in Relation to Domestic Animals; Beginners' Guide to the Microscope; Microscopy and Drug Examination....... 69

Necrology 84

Minutes of Cleveland Meeting 85

Custodian's Report 86

Treasurer's Report 87